CLAIMS

What is claimed is:

1. An optical apparatus, comprising:
a planar waveguide substrate;
a micro-hermetic cavity formed on the waveguide substrate;
a planar transmission optical waveguide formed on the waveguide substrate for enabling optical power transfer between an interior volume of the micro-hermetic cavity and a volume exterior thereto; and
means for sealing the micro-hermetic cavity.

2. The apparatus of Claim 1, wherein the micro-hermetic cavity and the transmission optical waveguide are formed concurrently using a common material processing sequence.

3. The apparatus of Claim 2, wherein material forming the micro-hermetic cavity comprises at least one of core material and cladding material, the core material and the cladding material used to form the transmission optical waveguide.

4. The apparatus of Claim 1, further comprising:
multiple transmission optical waveguides formed concurrently on a common substrate wafer; and
multiple corresponding micro-hermetic cavities formed concurrently on the common substrate wafer,
wherein division of the substrate wafer results in multiple individual waveguide substrates having thereon at least one of the transmission optical waveguides and the corresponding micro-hermetic cavity.

5. The apparatus of Claim 1, the sealing means comprising a lid sealed around a perimeter of the micro-hermetic cavity, thereby separating the interior volume thereof from the volume exterior thereto.

6. The apparatus of Claim 5, the micro-hermetic cavity formed from core material and cladding material, the core material and cladding material also forming the transmission optical waveguide, and the core material and cladding material that

form the micro-hermetic cavity vertically arranged in substantially the same manner as the core material and cladding material that form the transmission optical waveguide, thereby forming a substantially flat upper surface around the perimeter of the micro-hermetic cavity for sealing the lid.

7. The apparatus of Claim 5, wherein material deposited over at least a portion of the transmission optical waveguide forms a substantially flat upper surface of the perimeter of the micro-hermetic cavity for sealing the lid.

8. The apparatus of Claim 1, further comprising at least one optical device assembled onto the waveguide substrate within the micro-hermetic cavity so as to enable optical power transfer between the optical device and the transmission optical waveguide.

9. The apparatus of Claim 8, the sealing means comprising a lid sealed around a perimeter of the micro-hermetic cavity, the optical device formed on the lid, the lid serving as a device substrate, sealing the lid onto the micro-hermetic cavity serving to position the optical device so as to enable optical power transfer between the optical device and the transmission optical waveguide.

10. The apparatus of Claim 8, the lid being adapted for conveying signals between the optical device and the volume exterior to the micro-hermetic cavity.

11. The apparatus of Claim 1, wherein the transmission optical waveguide is adapted for reducing optical loss induced by the presence of the micro-hermetic cavity.

12. The apparatus of Claim 11, further comprising a reflective coating formed on an upper surface of that portion of the transmission optical waveguide that intersects a perimeter of the micro-hermetic cavity.

13. The apparatus of Claim 11, further comprising a thickened upper cladding layer formed on that portion of the transmission optical waveguide that intersects a perimeter of the micro-hermetic cavity.

14. The apparatus of Claim 11, further comprising an upper core and a lower core formed within the transmission optical waveguide, the upper and lower cores separated by cladding material, the upper core contained within the micro-hermetic

cavity, the lower core enabling optical power transfer between the interior and exterior volumes of the micro-hermetic cavity, the upper and lower cores positioned for transverse-transfer of optical power therebetween within the micro-hermetic cavity.

15. The apparatus of Claim 1, the sealing means comprising an embedding medium at least partly filling the micro-hermetic cavity.

16. A method comprising:
forming a micro-hermetic cavity on a planar waveguide substrate;
forming a planar transmission optical waveguide on the waveguide substrate for enabling optical power transfer between an interior volume of the micro-hermetic cavity and a volume exterior thereto; and
sealing the micro-hermetic cavity.

17. The method of Claim 16, wherein the micro-hermetic cavity and the transmission optical waveguide are formed concurrently using a common material processing sequence.

18. The method of Claim 16,
wherein multiple transmission optical waveguides are formed concurrently on a common substrate wafer,
wherein multiple corresponding micro-hermetic cavities are formed concurrently on the common substrate wafer, and
further comprising dividing the substrate wafer into individual waveguide substrates having thereon at least one of the transmission optical waveguides and the corresponding micro-hermetic cavity.

19. The method of Claim 16, wherein a lid sealed around a perimeter of the micro-hermetic cavity is employed for sealing the optical device within the micro-hermetic cavity.

20. The method of Claim 16, further comprising assembling at least one optical device onto the waveguide substrate within the micro-hermetic cavity so as to enable

optical power transfer between the optical device and the transmission optical waveguide.

21. The method of Claim 16, further comprising adapting the transmission optical waveguide for reducing optical loss induced by the presence of the micro-hermetic cavity.

22. The method of Claim 16, further comprising at least partly filling the micro-hermetic cavity with an embedding medium, thereby sealing the micro-hermetic cavity.